



U N I V E R S I T Y O F  
**SOUTH CAROLINA**

**DEPARTMENT OF  
PHYSICS AND ASTRONOMY**

## **COLLOQUIUM**

*Speaker:*

**Professor Scott Crittenden  
Department of Physics & Astronomy  
University of South Carolina**

*Title:*

**“Electrogenic Bacteria: Microbial Fuel Cells, Bionanowires and Chemoelectric Biosensors”**

*Abstract:*

Bacteria capable of anaerobic respiration need a replacement for oxygen to serve as an electron acceptor. It has recently become clear that there are several genera that are capable of using macroscopic metallic electrodes for this purpose.

A microbial fuel cell (MFC) is a power generation device that utilizes these bacteria to directly oxidize organic fuel and deliver free electrons to an anode.

Also, some of these genera appear to produce Ohmic nanowires composed only of proteins.

Finally, since the electrical current produced is a byproduct of normal metabolism, its behavior over time under changing environmental circumstances (consumption of food, etc.) can serve as a direct, electrical, measurement of metabolic rate, in effect rendering the bacterium not just a sensor but a transducer as well.

I will give an overview of electrogenic bacteria, and discuss the current state of play with respect to MFCs and bacterial nanowires, and discuss my current research plans in this area. Positions are available for graduate and highly motivated undergraduate students.

**Jones Physical Science Center  
Rogers Room  
PSC 409**

**Thursday, February 28, 2008  
3:30 pm**

**Refreshments at 3:15 pm**

**Everyone invited**

**Hosted by:**

**Sanjib R. Mishra**